March 16, 1998

Mr. James M. Levine
Senior Vice President, Nuclear
Arizona Public Service Company
Post Office Box 53999
Phoenix, Arizona 85072-3999

SUBJECT: ISSUANCE OF AMENDMENTS FOR THE PALO VERDE NUCLEAR GENERATING STATION UNIT NO. 1 (TAC NO. MA0298), UNIT NO. 2 (TAC NO. MA0299), AND UNIT NO. 3 (TAC NO. MA0300)

Dear Mr. Levine:

The Commission has issued the enclosed Amendment No. 116 to Facility Operating License No. NPF-41, Amendment No. 109 to Facility Operating License No. NPF-51, and Amendment No. 88 to Facility Operating License No. NPF-74 for the Palo Verde Nuclear Generating Station, Unit Nos. 1, 2, and 3, respectively. The amendments consist of changes to the Technical Specifications in response to your application dated December 17, 1997.

These amendments modify the technical specifications (TS) to remove the reference to Exide batteries with a generic reference to low specific gravity cell batteries.

A copy of the related Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's next biweekly Federal Register notice.

Sincerely,
Original Signed By Kristine M. Thomas for
James W. Clifford, Senior Project Manager
Project Directorate IV-2
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Docket Nos. STN 50-528, STN 50-529
and STN 50-530

Enclosures: 1. Amendment No. 116 to NPF-41
2. Amendment No. 109 to NPF-51
3. Amendment No. 88 to NPF-74
4. Safety Evaluation

cc w/encls: See next page

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DOCUMENT NAME: PVA0298.AMD

OFC	PDIV-2/PM	PDIV-2/LA	OGC	
NAME	JClifford	EPeyton		
DATE	2/25/98	2/25/98	3/12/98	

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CP-1

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

ARIZONA PUBLIC SERVICE COMPANY, ET AL.

DOCKET NO. STN 50-528

PALO VERDE NUCLEAR GENERATING STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 116
License No. NPF-41

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by the Arizona Public Service Company (APS or the licensee) on behalf of itself and the Salt River Project Agricultural Improvement and Power District, El Paso Electric Company, Southern California Edison Company, Public Service Company of New Mexico, Los Angeles Department of Water and Power, and Southern California Public Power Authority dated December 17, 1997, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C(2) of Facility Operating License No. NPF-41 is hereby amended to read as follows:

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 116, and the Environmental Protection Plan contained in Appendix B, are hereby incorporated into this license. APS shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan, except where otherwise stated in specific license conditions.

3. This license amendment is effective as of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Kristine M. Thomas for

James W. Clifford, Senior Project Manager
Project Directorate IV-2
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: March 16, 1998

ATTACHMENT TO LICENSE AMENDMENT

AMENDMENT NO. 116 TO FACILITY OPERATING LICENSE NO. NPF-41

DOCKET NO. STN 50-528

Replace the following pages of the Appendix A Technical Specifications with the enclosed pages. The revised pages are identified by Amendment number and contain marginal lines indicating the areas of change. The corresponding overleaf pages are also provided to maintain document completeness.

REMOVE	INSERT
3/4 8-9	3/4 8-9
3/4 8-10	3/4 8-10
3/4 8-12	3/4 8-12
B 3/4 8-20	B 3/4 8-20
B 3/4 8-21	B 3/4 8-21

ELECTRICAL POWER SYSTEMS

3/4.8.2 D.C. SOURCES

OPERATING

LIMITING CONDITION FOR OPERATION

3.8.2.1 As a minimum the D.C. trains listed in Table 3.8-1 shall be OPERABLE and energized.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTION:

a. With one of the required D.C. trains inoperable, restore the inoperable D.C. trains to OPERABLE status within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

b. With one of the required chargers inoperable, either provide charging capability to the affected channel with the associated backup battery charger, or demonstrate the OPERABILITY of its associated battery bank by performing Surveillance Requirement 4.8.2.1a.1. within 1 hour, and at least once per 8 hours thereafter. If any Category A limit in Table 4.8-2 is not met, declare the battery inoperable.

SURVEILLANCE REQUIREMENTS

4.8.2.1 Each 125-volt battery bank and charger shall be demonstrated OPERABLE:

a. At least once per 7 days by verifying that:

1. The parameters in Table 4.8-2 meet the Category A limits, and

2. The total battery terminal voltage is greater than or equal to 129 volts on float charge (low specific gravity cells) or 131 volts on float charge (AT&T).

SURVEILLANCE REQUIREMENTS (Continued)

b. At least once per 92 days and within 7 days after a battery discharge with battery terminal voltage below 105 volts, or battery overcharge with battery terminal voltage above 150 volts, by verifying that:

1. The parameters in Table 4.8-2 meet the Category B limits,

2. There is no visible corrosion at either terminals or connectors, or the connection resistance of these items is less than 150 x 10^{-6} ohms, and

3. The average electrolyte temperature of six connected cells is above 60°F.

c. At least once per 18 months by verifying that:

1. The cells, cell plates, and battery racks show no visual indication of physical damage or abnormal deterioration,

2. The cell-to-cell and terminal connections are clean, tight, and coated with anticorrosion material,

3. The resistance of each cell-to-cell and terminal connection is less than or equal to 150 x 10^{-6} ohms, and

4. The battery charger will supply at least 400 amperes for batteries A and B and 300 amperes for batteries C and D at 125 volts for at least 8 hours.

d. At least once per 18 months, during shutdown, by verifying that the battery capacity is adequate to supply and maintain in OPERABLE status all of the actual or simulated emergency loads for the design duty cycle when the battery is subjected to a battery service test.

e. At least once per 60 months, during shutdown, by verifying that the battery capacity is at least 80% (low specific gravity cells) or 90% (AT&T) of the manufacturer's rating when subjected to a performance discharge test. This performance discharge test may be performed in lieu of the battery service test required by Surveillance Requirement 4.8.2.1d.

f. Annual performance discharge tests of battery capacity shall be given to any battery that shows signs of degradation or has reached 85% of the service life expected for the application. Degradation is indicated when the battery capacity drops more than 10% (low specific gravity cells) or 5% (AT&T) of rated capacity from its average on previous performance tests, or is below 90% (low specific gravity cells) or 95% (AT&T) of the manufacturer's rating.

TABLE 4.8-2 (Low Specific Gravity Cells)

BATTERY SURVEILLANCE REQUIREMENTS

	CATEGORY A[1]	CATEGORY B[2]	
Parameter	Limits for each designated pilot cell	Limits for each connected cell	Allowable[3] value for each connected cell
Electrolyte Level	>Minimum level indication mark, and ≤ ¼" above maximum level indication mark	>Minimum level indication mark, and ≤ ¼" above maximum level indication mark	Above top of plates, and not overflowing
Float Voltage	≥ 2.13 volts	≥ 2.13 volts(a)	> 2.07 volts
Specific Gravity(b)		≥ 1.195	Not more than 0.020 below the average of all connected cells
	≥ 1.200(c)	Average of all connected cells > 1.205	Average of all connected cells ≥ 1.195(c)

(1) For any Category A parameter(s) outside the limit(s) shown, the battery may be considered OPERABLE provided that within 24 hours all the Category B measurements are taken and found to be within their allowable values, and provided all Category A and B parameter(s) are restored to within limits within the next 6 days.

(2) For any Category B parameter(s) outside the limit(s) shown, the battery may be considered OPERABLE provided that the Category B parameters are within their allowable values and provided the Category B parameter(s) are restored to within limits within 7 days.

(3) Any Category B parameter not within its allowable value, declare the battery inoperable.

(a) Corrected for average electrolyte temperature.

(b) Corrected for electrolyte temperature and level.

(c) Or battery charging current is less than 2 amps when on charge.

of 48 hours is sufficient to complete the restoration of the required level prior to declaring the EDG inoperable. This period is acceptable based on the remaining capacity (> 6 days), the fact that procedures will be initiated to obtain replenishment, and the low probability of an event during this brief period. With the required ACTION and associated completion time not met, the associated EDG may be incapable of performing its intended function and must be immediately declared inoperable.

b. With the stored fuel oil viscosity not within the required limits, a period of 30 days is allowed for restoration. This restoration may involve feed and bleed procedures, filtering, or combinations of these procedures. Even if an EDG start and load was required during the 30 day frequency and the fuel oil viscosity was outside its limits, there is a high likelihood that the EDG would still be capable of performing its intended function. With the required ACTION and associated completion time not met, the associated EDG may be incapable of performing its intended function and must be immediately declared inoperable.

c. With the stored fuel oil water and sediment not within the required limits, the associated EDG may not be capable of performing its intended function and must be immediately declared inoperable.

SURVEILLANCE REQUIREMENTS:

SR 4.8.1.3.1.1 provides verification that there is an adequate inventory of fuel oil in the storage tanks to support each EDG's operation for 7 days at full load. The 7 day period is sufficient time to place the unit in a safe shutdown condition and to bring in replenishment fuel from an outside source. The 31 day SR is adequate to ensure that a sufficient supply of fuel oil is available, since low level alarms are provided and unit operators would be aware of any large uses of fuel oil during this period.

SR 4.8.1.3.1.2 ensures the availability of high quality fuel oil for the EDGs. The frequency of this test (92 days) takes into consideration the low humidity and infrequent rainfall at the site and is an exception to RG 1.137, and is consistent with UFSAR Section 1.8.

SR 4.8.1.3.2 ensures that the cathodic protection system is capable of minimizing external corrosion for the fuel oil storage tanks.

BASES

The OPERABILITY of the AC and DC power sources and associated distribution systems during operation ensures that sufficient power will be available to supply the safety-related equipment required for (1) the safe shutdown of the unit and (2) the mitigation and control of accident conditions within the unit. As required by 10CFR50, Appendix A, GDC 17, the design of the AC electrical power system provides independence and redundancy to ensure an available source of power to the Engineered Safety Feature (ESF) systems.

The OPERABILITY of the minimum specified AC and DC power sources and associated distribution systems during shutdown and refueling ensures that (1) the unit can be maintained in the shutdown or refueling condition for extended time periods, (2) sufficient instrumentation and control capability is available for monitoring and maintaining the unit status, and (3) adequate AC electrical power is provided to mitigate events postulated during shutdown, such as an inadvertent draindown of the vessel or a fuel handling accident.

The OPERABILITY of the power sources are consistent with the initial condition assumptions of the safety analyses and are based upon maintaining at least one redundant set of onsite AC and DC power sources and associated distribution systems OPERABLE during accident conditions coincident with an assumed loss-of-offsite power and single failure of the other onsite AC source.

The ACTION requirements specified for the level of degradation of the power sources provide restriction upon continued unit operation commensurate with the level of degradation.

The surveillance requirement for demonstrating the OPERABILITY of the Station batteries are based on the recommendations of RG 1.129, "Maintenance Testing and Replacement of Large Lead Storage Batteries for Nuclear Power Plant," February 1978, and IEEE Std 450-1980, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Generating Stations and Substations."

Verifying average electrolyte temperature above the minimum for which the battery was sized, total battery terminal voltage on float charge, connection resistance values and the performance of battery service and discharge tests ensures the effectiveness of the charging system, the ability to handle high discharge rates and compares the battery capacity at that time with the rated capacity.

Table 4.8-2 specifies the normal limits for each designated pilot cell and each connected cell for electrolyte level, float voltage and specific gravity. The limits for the designated pilot cells float voltage and specific gravity, greater than 2.13 volts (low specific gravity cells) 2.18 volts (AT&T) and 0.010 below the manufacturer's full charge specific gravity or a battery charger current that had stabilized at a low value, is characteristic of a charged cell with adequate capacity. The normal limits for each connected cell for float voltage and specific gravity, greater than 2.13 volts

BASES

(low specific gravity cells) 2.18 volts (AT&T) and not more than 0.020 below the manufacturer's full charge specific gravity with an average specific gravity of all the connected cells not more than 0.010 below the manufacturer's full charge specific gravity, ensures the OPERABILITY and capability of the battery.

Operation with a battery cell's parameter outside the normal limit but within the allowable value specified in Table 4.8-2 is permitted for up to 7 days. During this 7-day period: (1) the allowable values for electrolyte level ensures no physical damage to the plates with an adequate electron transfer capability; (2) the allowable value for the average specific gravity of all the cells, not more than 0.020 below the manufacturer's recommended full charge specific gravity, ensures that the decrease in rating will be less than the safety margin provided in sizing; (3) the allowable value for an individual cell's specific gravity, ensures that an individual cell's specific gravity will not be more than 0.040 below the manufacturer's full charge specific gravity and that the overall capability of the battery will be maintained within an acceptable limit; and (4) the allowable value for an individual cell's float voltage, greater than 2.07 volts (low specific gravity cells) 2.14 volts (AT&T), ensures the battery's capability to perform its design function.

BASES

REFERENCES:

1. 10 CFR 50, Appendix A, GDC 17
2. Updated FSAR, Chapter 1
3. Updated FSAR, Chapter 8
4. GL 84-15, "Proposed Staff Actions to Improve and Maintain Diesel Generator Reliability," July 2, 1984.
5. RG 1.9, Revision 3, "Selection, Design, Qualification and Testing of Emergency Diesel Generator Units Used as Class 1E Onsite Electric Power Systems at Nuclear Power Plants," July 1993.
6. RG 1.93, "Availability of Electric Power Sources," Revision 0, December 1974.
7. RG 1.129, "Maintenance Testing and Replacement of Large Lead Storage Batteries for Nuclear Power Plants," Revision 1, February 1978
8. RG 1.137, "Fuel Oil Systems for Standby Diesel Generators," Revision 1, October 1979.
9. ASME, Boiler and Pressure Vessel Code, Section XI
10. IEEE Standard 308-1974, "IEEE Standard Criteria for Class 1E Power Systems for Nuclear Power Generating Stations."
11. IEEE Std 450-1980, "IEEE Recommended Practice for Maintenance, Testing, and Replacement"of Large Lead Storage Batteries for Generating Stations."

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

ARIZONA PUBLIC SERVICE COMPANY, ET AL.

DOCKET NO. STN 50-529

PALO VERDE NUCLEAR GENERATING STATION, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 109
License No. NPF-51

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by the Arizona Public Service Company (APS or the licensee) on behalf of itself and the Salt River Project Agricultural Improvement and Power District, El Paso Electric Company, Southern California Edison Company, Public Service Company of New Mexico, Los Angeles Department of Water and Power, and Southern California Public Power Authority dated December 17, 1997, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C(2) of Facility Operating License No. NPF-51 is hereby amended to read as follows:

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 109 , and the Environmental Protection Plan contained in Appendix B, are hereby incorporated into this license. APS shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan, except where otherwise stated in specific license conditions.

3. This license amendment is effective as of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Kristine M. Thomas for

James W. Clifford, Senior Project Manager
Project Directorate IV-2
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: March 16, 1998

ATTACHMENT TO LICENSE AMENDMENT

AMENDMENT NO. 109 TO FACILITY OPERATING LICENSE NO. NPF-51

DOCKET NO. STN 50-529

Replace the following pages of the Appendix A Technical Specifications with the enclosed pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change. The corresponding overleaf pages are also provided to maintain document completeness.

REMOVE	INSERT
3/4 8-9	3/4 8-9
3/4 8-10	3/4 8-10
3/4 8-12	3/4 8-12
B 3/4 8-20	B 3/4 8-20
B 3/4 8-21	B 3/4 8-21

ELECTRICAL POWER SYSTEMS

3/4.8.2 D.C. SOURCES

OPERATING

LIMITING CONDITION FOR OPERATION

3.8.2.1 As a minimum the D.C. trains listed in Table 3.8-1 shall be OPERABLE and energized.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTION:

a. With one of the required D.C. trains inoperable, restore the inoperable D.C. trains to OPERABLE status within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

b. With one of the required chargers inoperable, either provide charging capability to the affected channel with the associated backup battery charger, or demonstrate the OPERABILITY of its associated battery bank by performing Surveillance Requirement 4.8.2.1a.1. within 1 hour, and at least once per 8 hours thereafter. If any Category A limit in Table 4.8-2 is not met, declare the battery inoperable.

SURVEILLANCE REQUIREMENTS

4.8.2.1 Each 125-volt battery bank and charger shall be demonstrated OPERABLE:

a. At least once per 7 days by verifying that:

1. The parameters in Table 4.8-2 meet the Category A limits, and

2. The total battery terminal voltage is greater than or equal to 129 volts on float charge (low specific gravity cells) or 131 volts on float charge (AT&T).

SURVEILLANCE REQUIREMENTS (Continued)

b. At least once per 92 days and within 7 days after a battery discharge with battery terminal voltage below 105 volts, or battery overcharge with battery terminal voltage above 150 volts, by verifying that:

1. The parameters in Table 4.8-2 meet the Category B limits,

2. There is no visible corrosion at either terminals or connectors, or the connection resistance of these items is less than 150×10^{-6} ohms, and

3. The average electrolyte temperature of six connected cells is above 60°F.

c. At least once per 18 months by verifying that:

1. The cells, cell plates, and battery racks show no visual indication of physical damage or abnormal deterioration,

2. The cell-to-cell and terminal connections are clean, tight, and coated with anticorrosion material,

3. The resistance of each cell-to-cell and terminal connection is less than or equal to 150×10^{-6} ohms, and

4. The battery charger will supply at least 400 amperes for batteries A and B and 300 amperes for batteries C and D at 125 volts for at least 8 hours.

d. At least once per 18 months, during shutdown, by verifying that the battery capacity is adequate to supply and maintain in OPERABLE status all of the actual or simulated emergency loads for the design duty cycle when the battery is subjected to a battery service test.

e. At least once per 60 months, during shutdown, by verifying that the battery capacity is at least 80% (low specific gravity cells) or 90% (AT&T) of the manufacturer's rating when subjected to a performance discharge test. This performance discharge test may be performed in lieu of the battery service test required by Surveillance Requirement 4.8.2.1d.

f. Annual performance discharge tests of battery capacity shall be given to any battery that shows signs of degradation or has reached 85% of the service life expected for the application. Degradation is indicated when the battery capacity drops more than 10% (low specific gravity cells) or 5% (AT&T) of rated capacity from its average on previous performance tests, or is below 90% (low specific gravity cells) or 95% (AT&T) of the manufacturer's rating.

TABLE 4.8-2 (Low Specific Gravity Cells)

BATTERY SURVEILLANCE REQUIREMENTS

	CATEGORY A[1]	CATEGORY B[2]	
Parameter	Limits for each designated pilot cell	Limits for each connected cell	Allowable[3] value for each connected cell
Electrolyte Level	>Minimum level indication mark, and ≤ ¼" above maximum level indication mark	>Minimum level indication mark, and ≤ ¼" above maximum level indication mark	Above top of plates, and not overflowing
Float Voltage	≥ 2.13 volts	≥ 2.13 volts(a)	> 2.07 volts
Specific Gravity(b)		≥ 1.195	Not more than 0.020 below the average of all connected cells
	≥ 1.200(c)	Average of all connected cells > 1.205	Average of all connected cells ≥ 1.195(c)

(1) For any Category A parameter(s) outside the limit(s) shown, the battery may be considered OPERABLE provided that within 24 hours all the Category B measurements are taken and found to be within their allowable values, and provided all Category A and B parameter(s) are restored to within limits within the next 6 days.

(2) For any Category B parameter(s) outside the limit(s) shown, the battery may be considered OPERABLE provided that the Category B parameters are within their allowable values and provided the Category B parameter(s) are restored to within limits within 7 days.

(3) Any Category B parameter not within its allowable value, declare the battery inoperable.

(a) Corrected for average electrolyte temperature.

(b) Corrected for electrolyte temperature and level.

(c) Or battery charging current is less than 2 amps when on charge.

of 48 hours is sufficient to complete the restoration of the required level prior to declaring the EDG inoperable. This period is acceptable based on the remaining capacity (> 6 days), the fact that procedures will be initiated to obtain replenishment, and the low probability of an event during this brief period. With the required ACTION and associated completion time not met, the associated EDG may be incapable of performing its intended function and must be immediately declared inoperable.

b. With the stored fuel oil viscosity not within the required limits, a period of 30 days is allowed for restoration. This restoration may involve feed and bleed procedures, filtering, or combinations of these procedures. Even if an EDG start and load was required during the 30 day frequency and the fuel oil viscosity was outside its limits, there is a high likelihood that the EDG would still be capable of performing its intended function. With the required ACTION and associated completion time not met, the associated EDG may be incapable of performing its intended function and must be immediately declared inoperable.

c. With the stored fuel oil water and sediment not within the required limits, the associated EDG may not be capable of performing its intended function and must be immediately declared inoperable.

SURVEILLANCE REQUIREMENTS:

SR 4.8.1.3.1.1 provides verification that there is an adequate inventory of fuel oil in the storage tanks to support each EDG's operation for 7 days at full load. The 7 day period is sufficient time to place the unit in a safe shutdown condition and to bring in replenishment fuel from an outside source. The 31 day SR is adequate to ensure that a sufficient supply of fuel oil is available, since low level alarms are provided and unit operators would be aware of any large uses of fuel oil during this period.

SR 4.8.1.3.1.2 ensures the availability of high quality fuel oil for the EDGs. The frequency of this test (92 days) takes into consideration the low humidity and infrequent rainfall at the site and is an exception to RG 1.137, and is consistent with UFSAR Section 1.8.

SR 4.8.1.3.2 ensures that the cathodic protection system is capable of minimizing external corrosion for the fuel oil storage tanks.

BASES

The OPERABILITY of the AC and DC power sources and associated distribution systems during operation ensures that sufficient power will be available to supply the safety-related equipment required for (1) the safe shutdown of the unit and (2) the mitigation and control of accident conditions within the unit. As required by 10CFR50, Appendix A, GDC 17, the design of the AC electrical power system provides independence and redundancy to ensure an available source of power to the Engineered Safety Feature (ESF) systems.

The OPERABILITY of the minimum specified AC and DC power sources and associated distribution systems during shutdown and refueling ensures that (1) the unit can be maintained in the shutdown or refueling condition for extended time periods, (2) sufficient instrumentation and control capability is available for monitoring and maintaining the unit status, and (3) adequate AC electrical power is provided to mitigate events postulated during shutdown, such as an inadvertent draindown of the vessel or a fuel handling accident.

The OPERABILITY of the power sources are consistent with the initial condition assumptions of the safety analyses and are based upon maintaining at least one redundant set of onsite AC and DC power sources and associated distribution systems OPERABLE during accident conditions coincident with an assumed loss-of-offsite power and single failure of the other onsite AC source.

The ACTION requirements specified for the level of degradation of the power sources provide restriction upon continued unit operation commensurate with the level of degradation.

The surveillance requirement for demonstrating the OPERABILITY of the Station batteries are based on the recommendations of RG 1.129, "Maintenance Testing and Replacement of Large Lead Storage Batteries for Nuclear Power Plant," February 1978, and IEEE Std 450-1980, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Generating Stations and Substations."

Verifying average electrolyte temperature above the minimum for which the battery was sized, total battery terminal voltage on float charge, connection resistance values and the performance of battery service and discharge tests ensures the effectiveness of the charging system, the ability to handle high discharge rates and compares the battery capacity at that time with the rated capacity.

Table 4.8-2 specifies the normal limits for each designated pilot cell and each connected cell for electrolyte level, float voltage and specific gravity. The limits for the designated pilot cells float voltage and specific gravity, greater than 2.13 volts (low specific gravity cells) 2.18 volts (AT&T) and 0.010 below the manufacturer's full charge specific gravity or a battery charger current that had stabilized at a low value, is characteristic of a charged cell with adequate capacity. The normal limits for each connected cell for float voltage and specific gravity, greater than 2.13 volts (low

BASES

specific gravity cells) 2.18 volts (AT&T) and not more than 0.020 below the manufacturer's full charge specific gravity with an average specific gravity of all the connected cells not more than 0.010 below the manufacturer's full charge specific gravity, ensures the OPERABILITY and capability of the battery.

Operation with a battery cell's parameter outside the normal limit but within the allowable value specified in Table 4.8-2 is permitted for up to 7 days. During this 7-day period: (1) the allowable values for electrolyte level ensures no physical damage to the plates with an adequate electron transfer capability; (2) the allowable value for the average specific gravity of all the cells, not more than 0.020 below the manufacturer's recommended full charge specific gravity, ensures that the decrease in rating will be less than the safety margin provided in sizing; (3) the allowable value for an individual cell's specific gravity, ensures that an individual cell's specific gravity will not be more than 0.040 below the manufacturer's full charge specific gravity and that the overall capability of the battery will be maintained within an acceptable limit; and (4) the allowable value for an individual cell's float voltage, greater than 2.07 volts (low specific gravity cells) 2.14 volts (AT&T), ensures the battery's capability to perform its design function.

BASES

REFERENCES:

1. 10 CFR 50, Appendix A, GDC 17
2. Updated FSAR, Chapter 1
3. Updated FSAR, Chapter 8
4. GL 84-15, "Proposed Staff Actions to Improve and Maintain Diesel Generator Reliability," July 2, 1984.
5. RG 1.9, Revision 3, "Selection, Design, Qualification and Testing of Emergency Diesel Generator Units Used as Class 1E Onsite Electric Power Systems at Nuclear Power Plants," July 1993.
6. RG 1.93, "Availability of Electric Power Sources," Revision 0, December 1974.
7. RG 1.129, "Maintenance Testing and Replacement of Large Lead Storage Batteries for Nuclear Power Plants," Revision 1, February 1978
8. RG 1.137, "Fuel Oil Systems for Standby Diesel Generators," Revision 1, October 1979.
9. ASME, Boiler and Pressure Vessel Code, Section XI
10. IEEE Standard 308-1974, "IEEE Standard Criteria for Class 1E Power Systems for Nuclear Power Generating Stations."
11. IEEE Std 450-1980, "IEEE Recommended Practice for Maintenance, Testing, and Replacement"of Large Lead Storage Batteries for Generating Stations."

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

ARIZONA PUBLIC SERVICE COMPANY, ET AL.

DOCKET NO. STN 50-530

PALO VERDE NUCLEAR GENERATING STATION, UNIT NO. 3

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 88
License No. NPF-74

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by the Arizona Public Service Company (APS or the licensee) on behalf of itself and the Salt River Project Agricultural Improvement and Power District, El Paso Electric Company, Southern California Edison Company, Public Service Company of New Mexico, Los Angeles Department of Water and Power, and Southern California Public Power Authority dated December 17, 1997, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C(2) of Facility Operating License No. NPF-74 is hereby amended to read as follows:

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 88 , and the Environmental Protection Plan contained in Appendix B, are hereby incorporated into this license. APS shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan, except where otherwise stated in specific license conditions.

3. This license amendment is effective as of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Kristine M. Thomas for

James W. Clifford, Senior Project Manager
Project Directorate IV-2
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: March 16, 1998

ATTACHMENT TO LICENSE AMENDMENT

AMENDMENT NO. 88 TO FACILITY OPERATING LICENSE NO. NPF-74

DOCKET NO. STN 50-530

Replace the following pages of the Appendix A Technical Specifications with the enclosed pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change. The corresponding overleaf pages are also provided to maintain document completeness.

REMOVE	INSERT
3/4 8-9	3/4 8-9
3/4 8-10	3/4 8-10
3/4 8-12	3/4 8-12
B 3/4 8-20	B 3/4 8-20
B 3/4 8-21	B 3/4 8-21

ELECTRICAL POWER SYSTEMS

3/4.8.2 D.C. SOURCES

OPERATING

LIMITING CONDITION FOR OPERATION

3.8.2.1 As a minimum the D.C. trains listed in Table 3.8-1 shall be OPERABLE and energized.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTION:

a. With one of the required D.C. trains inoperable, restore the inoperable D.C. trains to OPERABLE status within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

b. With one of the required chargers inoperable, either provide charging capability to the affected channel with the associated backup battery charger, or demonstrate the OPERABILITY of its associated battery bank by performing Surveillance Requirement 4.8.2.1a.1. within 1 hour, and at least once per 8 hours thereafter. If any Category A limit in Table 4.8-2 is not met, declare the battery inoperable.

SURVEILLANCE REQUIREMENTS

4.8.2.1 Each 125-volt battery bank and charger shall be demonstrated OPERABLE:

a. At least once per 7 days by verifying that:

1. The parameters in Table 4.8-2 meet the Category A limits, and

2. The total battery terminal voltage is greater than or equal to 129 volts on float charge (low specific gravity cells) or 131 volts on float charge (AT&T).

SUVEILLANCE REQUIREMENTS (Continued)

b. At least once per 92 days and within 7 days after a battery discharge with battery terminal voltage below 105 volts, or battery overcharge with battery terminal voltage above 150 volts, by verifying that:

1. The parameters in Table 4.8-2 meet the Category B limits,

2. There is no visible corrosion at either terminals or connectors, or the connection resistance of these items is less than 150×10^{-6} ohms, and

3. The average electrolyte temperature of six connected cells is above 60°F.

c. At least once per 18 months by verifying that:

1. The cells, cell plates, and battery racks show no visual indication of physical damage or abnormal deterioration,

2. The cell-to-cell and terminal connections are clean, tight, and coated with anticorrosion material,

3. The resistance of each cell-to-cell and terminal connection is less than or equal to 150×10^{-6} ohms, and

4. The battery charger will supply at least 400 amperes for batteries A and B and 300 amperes for batteries C and D at 125 volts for at least 8 hours.

d. At least once per 18 months, during shutdown, by verifying that the battery capacity is adequate to supply and maintain in OPERABLE status all of the actual or simulated emergency loads for the design duty cycle when the battery is subjected to a battery service test.

e. At least once per 60 months, during shutdown, by verifying that the battery capacity is at least 80% (low specific gravity cells) or 90% (AT&T) of the manufacturer's rating when subjected to a performance discharge test. This performance discharge test may be performed in lieu of the battery service test required by Surveillance Requirement 4.8.2.1d.

f. Annual performance discharge tests of battery capacity shall be given to any battery that shows signs of degradation or has reached 85% of the service life expected for the application. Degradation is indicated when the battery capacity drops more than 10% (low specific gravity cells) or 5% (AT&T) of rated capacity from its average on previous performance tests, or is below 90% (low specific gravity cells) or 95% (AT&T) of the manufacturer's rating.

TABLE 4.8-2 (Low Specific Gravity Cells)

BATTERY SURVEILLANCE REQUIREMENTS

	CATEGORY A(1)	CATEGORY B(2)	
Parameter	Limits for each designated pilot cell	Limits for each connected cell	Allowable(3) value for each connected cell
Electrolyte Level	>Minimum level indication mark, and ≤ ¼" above maximum level indication mark	>Minimum level indication mark, and ≤ ¼" above maximum level indication mark	Above top of plates, and not overflowing
Float Voltage	≥ 2.13 volts	≥ 2.13 volts(a)	> 2.07 volts
Specific Gravity(b)		≥ 1.195	Not more than 0.020 below the average of all connected cells
	≥ 1.200(c)	Average of all connected cells ≥ 1.205	Average of all connected cells ≥ 1.195(c)

(1) For any Category A parameter(s) outside the limit(s) shown, the battery may be considered OPERABLE provided that within 24 hours all the Category B measurements are taken and found to be within their allowable values, and provided all Category A and B parameter(s) are restored to within limits within the next 6 days.

(2) For any Category B parameter(s) outside the limit(s) shown, the battery may be considered OPERABLE provided that the Category B parameters are within their allowable values and provided the Category B parameter(s) are restored to within limits within 7 days.

(3) Any Category B parameter not within its allowable value, declare the battery inoperable.

(a) Corrected for average electrolyte temperature.

(b) Corrected for electrolyte temperature and level.

(c) Or battery charging current is less than 2 amps when on charge.

of 48 hours is sufficient to complete the restoration of the required level prior to declaring the EDG inoperable. This period is acceptable based on the remaining capacity (> 6 days), the fact that procedures will be initiated to obtain replenishment, and the low probability of an event during this brief period. With the required ACTION and associated completion time not met, the associated EDG may be incapable of performing its intended function and must be immediately declared inoperable.

b. With the stored fuel oil viscosity not within the required limits, a period of 30 days is allowed for restoration. This restoration may involve feed and bleed procedures, filtering, or combinations of these procedures. Even if an EDG start and load was required during the 30 day frequency and the fuel oil viscosity was outside its limits, there is a high likelihood that the EDG would still be capable of performing its intended function. With the required ACTION and associated completion time not met, the associated EDG may be incapable of performing its intended function and must be immediately declared inoperable.

c. With the stored fuel oil water and sediment not within the required limits, the associated EDG may not be capable of performing its intended function and must be immediately declared inoperable.

SURVEILLANCE REQUIREMENTS:

SR 4.8.1.3.1.1 provides verification that there is an adequate inventory of fuel oil in the storage tanks to support each EDG's operation for 7 days at full load. The 7 day period is sufficient time to place the unit in a safe shutdown condition and to bring in replenishment fuel from an outside source. The 31 day SR is adequate to ensure that a sufficient supply of fuel oil is available, since low level alarms are provided and unit operators would be aware of any large uses of fuel oil during this period.

SR 4.8.1.3.1.2 ensures the availability of high quality fuel oil for the EDGs. The frequency of this test (92 days) takes into consideration the low humidity and infrequent rainfall at the site and is an exception to RG 1.137, and is consistent with UFSAR Section 1.8.

SR 4.8.1.3.2 ensures that the cathodic protection system is capable of minimizing external corrosion for the fuel oil storage tanks.

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The OPERABILITY of the AC and DC power sources and associated distribution systems during operation ensures that sufficient power will be available to supply the safety-related equipment required for (1) the safe shutdown of the unit and (2) the mitigation and control of accident conditions within the unit. As required by 10CFR50, Appendix A, GDC 17, the design of the AC electrical power system provides independence and redundancy to ensure an available source of power to the Engineered Safety Feature (ESF) systems.

The OPERABILITY of the minimum specified AC and DC power sources and associated distribution systems during shutdown and refueling ensures that (1) the unit can be maintained in the shutdown or refueling condition for extended time periods, (2) sufficient instrumentation and control capability is available for monitoring and maintaining the unit status, and (3) adequate AC electrical power is provided to mitigate events postulated during shutdown, such as an inadvertent draindown of the vessel or a fuel handling accident.

The OPERABILITY of the power sources are consistent with the initial condition assumptions of the safety analyses and are based upon maintaining at least one redundant set of onsite AC and DC power sources and associated distribution systems OPERABLE during accident conditions coincident with an assumed loss-of-offsite power and single failure of the other onsite AC source.

The ACTION requirements specified for the level of degradation of the power sources provide restriction upon continued unit operation commensurate with the level of degradation.

The surveillance requirement for demonstrating the OPERABILITY of the Station batteries are based on the recommendations of RG 1.129, "Maintenance Testing and Replacement of Large Lead Storage Batteries for Nuclear Power Plant," February 1978, and IEEE Std 450-1980, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Generating Stations and Substations."

Verifying average electrolyte temperature above the minimum for which the battery was sized, total battery terminal voltage on float charge, connection resistance values and the performance of battery service and discharge tests ensures the effectiveness of the charging system, the ability to handle high discharge rates and compares the battery capacity at that time with the rated capacity.

Table 4.8-2 specifies the normal limits for each designated pilot cell and each connected cell for electrolyte level, float voltage and specific gravity. The limits for the designated pilot cells float voltage and specific gravity, greater than 2.13 volts (low specific gravity cells) 2.18 volts (AT&T) and 0.010 below the manufacturer's full charge specific gravity or a battery charger current that had stabilized at a low value, is characteristic of a charged cell with adequate capacity. The normal limits for each connected cell for float voltage and specific gravity, greater than 2.13 volts (low

BASES

specific gravity cells) 2.18 volts (AT&T) and not more than 0.020 below the manufacturer's full charge specific gravity with an average specific gravity of all the connected cells not more than 0.010 below the manufacturer's full charge specific gravity, ensures the OPERABILITY and capability of the battery.

Operation with a battery cell's parameter outside the normal limit but within the allowable value specified in Table 4.8-2 is permitted for up to 7 days. During this 7-day period: (1) the allowable values for electrolyte level ensures no physical damage to the plates with an adequate electron transfer capability; (2) the allowable value for the average specific gravity of all the cells, not more than 0.020 below the manufacturer's recommended full charge specific gravity, ensures that the decrease in rating will be less than the safety margin provided in sizing; (3) the allowable value for an individual cell's specific gravity, ensures that an individual cell's specific gravity will not be more than 0.040 below the manufacturer's full charge specific gravity and that the overall capability of the battery will be maintained within an acceptable limit; and (4) the allowable value for an individual cell's float voltage, greater than 2.07 volts (low specific gravity cells) 2.14 volts (AT&T), ensures the battery's capability to perform its design function.

BASES

REFERENCES:

1. 10 CFR 50, Appendix A, GDC 17
2. Updated FSAR, Chapter 1
3. Updated FSAR, Chapter 8
4. GL 84-15, "Proposed Staff Actions to Improve and Maintain Diesel Generator Reliability," July 2, 1984.
5. RG 1.9, Revision 3, "Selection, Design, Qualification and Testing of Emergency Diesel Generator Units Used as Class 1E Onsite Electric Power Systems at Nuclear Power Plants," July 1993.
6. RG 1.93, "Availability of Electric Power Sources," Revision 0, December 1974.
7. RG 1.129, "Maintenance Testing and Replacement of Large Lead Storage Batteries for Nuclear Power Plants," Revision 1, February 1978
8. RG 1.137, "Fuel Oil Systems for Standby Diesel Generators," Revision 1, October 1979.
9. ASME, Boiler and Pressure Vessel Code, Section XI
10. IEEE Standard 308-1974, "IEEE Standard Criteria for Class 1E Power Systems for Nuclear Power Generating Stations."
11. IEEE Std 450-1980, "IEEE Recommended Practice for Maintenance, Testing, and Replacement"of Large Lead Storage Batteries for Generating Stations."

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 116 TO FACILITY OPERATING LICENSE NO. NPF-41,

AMENDMENT NO. 109 TO FACILITY OPERATING LICENSE NO. NPF-51,

AND AMENDMENT NO. 88 TO FACILITY OPERATING LICENSE NO. NPF-74

ARIZONA PUBLIC SERVICE COMPANY, ET AL.

PALO VERDE NUCLEAR GENERATING STATION, UNIT NOS. 1, 2, AND 3

DOCKET NOS. STN 50-528, STN 50-529, AND STN 50-530

1.0 INTRODUCTION

By application dated December 17, 1997, the Arizona Public Service Company (APS or the licensee) requested changes to the Technical Specifications (Appendix A to Facility Operating License Nos. NPF-41, NPF-51, and NPF-74, respectively) for the Palo Verde Nuclear Generating Station, Units 1, 2, and 3 . The Arizona Public Service Company submitted this request on behalf of itself, the Salt River Project Agricultural Improvement and Power District, Southern California Edison Company, El Paso Electric Company, Public Service Company of New Mexico, Los Angeles Department of Water and Power, and Southern California Public Power Authority. The proposed changes would modify the technical specifications (TS) to remove the reference to Exide batteries with a generic reference to low specific gravity cell batteries. The proposed amendment would allow replacement of the existing AT&T round cell, Class 1E, 125V dc cells with low specific gravity cells that are manufactured by vendors other than those specified in the current specifications. The proposed amendment would also delete a footnote referring to one-time deferral of the battery service test on Unit 3 that is no longer applicable.

2.0 EVALUATION

The Class 1E, 125V dc power system at Palo Verde consists of two independent and redundant electrical power subsystems (Trains A and B). Each train consists of two 125V dc channels (Channels A and C for Train A, and Channels B and D for Train B). Each 125V dc channel is formed by one battery bank, one battery charger, one inverter, and the associated distribution system. Each train of 125V dc power is provided with a backup battery charger that may be manually connected to either dc channel in that train. The backup battery charger is configured such that it may be connected to only one dc channel in its respective train at a time.

The proposed amendment is necessary because the licensee plans to replace the existing high specific gravity round cell batteries manufactured by AT&T with conventional low specific gravity rectangular cell batteries. The batteries are being replaced as a preventive measure due to recent industry and PVNGS experience with the high specific gravity round cell betteries. The high specific gravity round cell batteries are experiencing premature capacity loss. The specifications for both the low specific gravity rectangular cell and high specific gravity round cell batteries will be maintained in the TS to allow plant operation with both types of batteries during the replacement sequence of the battery banks. This flexibility is required to ensure one train of Class 1E, 125V dc power source is maintained operable during the replacement of the battery banks of the other train.

The proposed amendment maintains the same performance criteria and cell parameters for the Class 1E 125V dc sources that are defined in the current TS for each unit. The replacement batteries will continue to meet the design criteria of IEEE 485-1978 for the design basis load profiles for each 125V dc channel, and for capacity margin at the end of their service life. No new or common mode failures are being created by replacing the existing high specific gravity round cell batteries with low specific gravity rectangular cell batteries. In addition, the new batteries will require replacement of the existing battery racks. The new battery racks have been designed to IEEE 344-1975 standards for seismic design.

Replacing the high specific gravity round cell batteries, which have experienced premature capacity loss, with low specific gravity rectangular cell batteries that have extensive industry experience, can enhance the overall reliability and performance of the Class 1E, 125V dc systems.

Based on the above considerations, the staff finds that the TS change to be acceptable.

3.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Arizona State official was notified of the proposed issuance of the amendments. The State official had no comments.

4.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and change surveillance requirements. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding (63 FR 2272). Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

5.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributors: D. Nguyen
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J. Clifford

Date: March 16, 1998